

Southeastern Cooperative Wildlife Disease Study

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Bob Strader
St. Catherine Creek National
Wildlife Refuge
P.O. Box 217
Sibley, Mississippi 39165

Dear Mr. Strader:

I have enclosed our report of the deer herd health check conducted on St. Catherine Creek National Wildlife Refuge, Adams County, Mississippi, on July 13-15, 2009. The health check involved examination of five deer. The data are arranged into a series of tables (parasitologic, serologic, and pathologic) and are accompanied by interpretive comments.

The last herd health check we conducted at this site was in September 1999. Our current data indicates a significant reduction in APC values commensurate with an improvement in nutritional condition of the deer. In 1999, the APC was 2,780, and the average nutritional condition was fair. Most recently, the APC value was 1,260. Three of the deer were in good nutritional condition, and two were considered fair. Although the APC data is directly correlated to deer density, the nutritional condition is clearly dependent upon environmental factors and habitat. Even though there has been a significant reduction in the APC, the value suggests that the deer population is still near nutritional carrying capacity and could be sensitive to sudden alterations in habitat quality (e.g. flood, mast failures, etc.). This information suggests that an increase in population density could have negative effects due to density dependent disease processes.

Serology indicates recent exposure of most of the deer to hemorrhagic disease. This may result in some herd immunity. Through recruitment of younger deer and loss of more mature animals, this immunity may decline over time, resulting in a more susceptible population.

I hope this information will be valuable to the management of this deer herd. Additional information on many of the parasites and diseases covered in this report can be obtained from the Field Manual of Wildlife Diseases or from our website at www.scwds.org. If you have any questions about the reports, please contact me.

Sincerely,



Kevin Keel, DVM, PhD, DACVP

Enclosures

CC: Mr. Larry Castle
Ms. Cynthia Dohner
Mr. Michael Piccirilli

Table 1. Arthropod, helminth, and protozoan parasites of five white-tailed deer (*Odocoileus virginianus*) collected from St. Catherine Creek National Wildlife Refuge, Adams and Wilkinson Counties, Mississippi, on July 13-15, 2009.

Animal Number	1	2	3	4	5	Animal Number	<u>Arthropods</u>				
							1	2	3	4	5
Age (years)	3.0	2.0	2.0	1.0	5.0	Lice	—	—	—	—	—
Sex	F	F	M	M	F	Louse Flies	Light	Light	Moderate	Moderate	Light
Weight (pounds)	137	113	114	74	131	Ticks	Light	—	—	Light	Light
Physical Condition	Good	Good	Fair	Fair	Good	Chiggers	—	—	—	—	—
Kidney Fat Index	90.8	118.7	NA	9.4	71.1	Ear Mites	—	—	—	—	—
Packed Cell Volume	42	40	44	26	43	Nasal Bots	—	—	—	Light	—
Serum Protein	6.5	6.5	7.0	6.5	8.0						

NA = Not Available

<u>Location in Host</u>	<u>Helminths</u>	<u>Number of Parasites Per Deer</u>					<u>Range</u>	<u>Prevalence</u>	<u>Average</u>
		1	2	3	4	5			
Lungs	<i>Dictyocaulus viviparus</i>	4	0	0	3	0	0-4	40%	1.4
	<i>Protostrongylid larvae</i>	+	+	+	+	—	—	80%	—
Abdominal Cavity	<i>Setaria yehi</i>	0	1	1	0	0	0-1	40%	0.4
Liver	<i>Fascioloides magna</i>	2	3	1	0	0	0-3	60%	1.2
Esophagus	<i>Gongylonema pulchrum</i>	0	1	0	0	0	0-1	20%	0.2
Rumen									
Abomasum	<i>Haemonchus contortus</i>	100	0	0	1,260	20	0-1,260	60%	276.0
	<i>Mazamastrongylus odocoilei</i>	102	0	0	0	0	0-102	20%	20.4
	<i>Mazamastrongylus purnglovei</i>	2,450	440	780	240	500	240-2,450	100%	882.0
	<i>Ostertagia dikmansii</i>	204	0	0	0	0	0-204	20%	40.8
APC = 1,260	<i>Ostertagia mossi</i>	204	0	0	0	0	0-204	20%	40.8

Protozoans

Blood	<i>Theileria cervi</i>	+	+	+	+	—	—	80%	—
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Table 2. Results of serologic tests and microbiologic/histologic assays for selected diseases in five white-tailed deer (*Odocoileus virginianus*) from St. Catherine Creek National Wildlife Refuge, Adams and Wilkinson Counties, Mississippi, on July 13-15, 2009.

Disease	Deer Number				
	1	2	3	4	5
<u>Serologic Tests</u>					
Leptospirosis					
(serotype <i>bratislava</i>)	Neg	Neg	Neg	Neg	Neg
(serotype <i>pomona</i>)	Neg	Neg	Neg	Neg	Neg
(serotype <i>hardjo</i>)	Neg	Neg	Pos	Neg	Neg
(serotype <i>grippityphosa</i>)	Neg	Neg	Neg	Neg	Neg
(serotype <i>icterohemorrhagiae</i>)	Neg	Neg	Neg	Neg	Neg
(serotype <i>canicola</i>)	Neg	Neg	Neg	Neg	Neg
Brucellosis	Neg	Neg	Neg	Neg	Neg
Infectious bovine rhinotracheitis (IBR)	Neg	Neg	Neg	Neg	Neg
Bovine virus diarrhea (BVD)	Neg	Neg	Neg	Neg	Neg
Parainfluenza ₃ (PI ₃)	Pos	Neg	Neg	Neg	Neg
Epizootic hemorrhagic disease (EHD)	Pos	Pos	Pos	Neg	Pos
Bluetongue (BT)	Pos	Wk+	Wk+	Neg	Wk+
<u>Microbiologic/Histologic Assays</u>					
Bovine tuberculosis ¹	Neg	Neg	Neg	Neg	Neg
Chronic wasting disease ²	Neg	Neg	Neg	Neg	Neg

¹ Gross and microscopic examination of retropharyngeal lymph nodes.

² Microscopic examination for lesions (H&E) and immunohistochemistry.

Table 3. Lesions and pathologic conditions in five white-tailed deer (*Odocoileus virginianus*) collected from St. Catherine Creek National Wildlife Refuge, Adams and Wilkinson Counties, Mississippi, on July 13-15, 2009.

Lesion/Condition	Deer Number				
	1	2	3	4	5
Granulomatous pneumonia with nematode emboli	1	1	1	1	-
Bronchitis/peribronchitis	1	1	1	1	-
Fibrous pleural adhesions	-	2	-	-	-
Pleural hyperplasia / fibrosis	-	-	1	1	-
Fibrinous peritonitis	-	-	1	-	-
Sarcocystosis	-	-	1	-	-

*Key: - = lesion or condition not present; 1 = minor tissue damage or mild pathologic change; 2 = moderate tissue damage or moderate pathologic change; 3 = extensive tissue damage or marked pathologic change.

INTERPRETIVE COMMENTS: White-tailed deer collected from St. Catherine Creek National Wildlife Refuge, Adams and Wilkinson Counties, Mississippi, on July 13-15, 2009.

Large lungworms (*Dictyocaulus viviparus*) were present at low numbers in three deer. Protostrongylid larvae, probably from muscleworms (*Parelaphostrongylus andersoni*) were present in four deer. Large lungworms and protostrongylid larvae were associated with mild lung damage (pleuritis, pneumonitis, pneumonia) in four deer. Abomasal parasites (*Haemonchus contortus*, *Mazamastrongylus odocoilei*, *M. purnglovei*, *Ostertagia dikmansi* and *O. mossi*) were present at a moderately high level (APC = 1,260) indicating the herd density may be near nutritional carrying capacity. The large stomach worm (*H. contortus*) was present at significant levels in one deer and can cause clinical disease, particularly in fawns. Gullet worms (*Gongylonema pulcrum*) were present at low numbers, but not considered important to herd health at the levels encountered. Liver flukes were present in three deer but at very low levels and are not considered a threat to deer health. Blood protozoans (*Theileria cervi*) were present in four deer but are not likely to be pathogenic. Light to moderate infestations of arthropod parasites (ticks, nasal bots and louse flies) were present in all deer but were not likely to cause clinically significant disease at the levels encountered.

Physical condition ratings, kidney fat indices, and body weights were moderate with one animal in fair condition and three in good nutritional condition; hematologic values of all deer were near the median values of healthy. Another deer had fibrinous peritonitis and pleural hyperplasia, both attributed to a *Setaria yehi* infestation. Mild sarcocystosis was found incidentally in the muscle of one deer. In addition to lesions attributable to parasitism (noted above), one deer had significant fibrous, pleural adhesions suggesting a healed infection. Serologic tests for circulating antibodies revealed prior exposure to the epizootic hemorrhagic disease virus and bluetongue virus in four deer. One deer had been exposed to leptospirosis, and another had circulating antibodies to parainfluenza-3, a virus usually associated with pneumonia in cattle. A number of other diseases including brucellosis, infectious bovine rhinotracheitis, bovine viral diarrhea, bovine tuberculosis and chronic wasting disease were not evident by serology or other assays.

An overview is as follows: (1) based on APC data and nutritional condition the herd is possibly near nutritional carrying capacity; (2) *Haemonchus contortus* is present and may cause fawn mortality or unthriftiness in adult deer if levels of infestation increase; (3) the deer are generally in fair nutritional condition; (4) the overall health status of the herd is such that disease-related mortality is probably not occurring to a significant extent at the present time. However, if the herd density increases mortality due to parasitosis could occur, particularly among fawns, due to lungworms and abomasal parasites.